

THE MINERAL INDUSTRY OF

SPAIN

By Harold R. Newman

Spain, which has some of the most mineralized territory in Western Europe, was a significant European producer of nonferrous and precious metals. The main polymetallic deposits, from west to east, include Tharsis, Scotiel, Rio Tinto, and Aznalcollar. In terms of value of mine output of metallic and nonmetallic minerals and quarry products, Spain was one of the leading European Union (EU) countries. Consequently, it had one of the highest levels of self-sufficiency with respect to mineral raw materials among the EU members. Of the approximately 100 mineral products mined, only 18 were produced in significant quantities—bentonite, copper, fluorspar, glauconite, gold, iron, lead, magnetite, mercury, potash, pyrites, quartz, refractory argillite, sea and rock salt, sepiolitic salts, tin, tungsten, and zinc (table 1).

Spain has a long history of base-metal mining, and although the number of active operations has halved in recent years, with copper production a notable casualty, the country remained an important lead and zinc producer. Moreover, several old and new prospects were being evaluated, and the level of exploration activity was high. Exploration was continuing for feldspar (Badajoz, Toledo, and Salamanca), garnet (Galicia), pyrites (Badajoz), and rutile and zircon (Cuidad Real).

Deposits vary widely in terms of age and geologic setting, with kuroko, sedimentary exhalative, and Mississippi-Valley-type replacement deposits and copper-gold skarns all represented, as well as the volcanic-hosted massive sulfide (VMS) deposits of the Iberian Pyrite Belt (IPB) of southern Spain. The IPB alone was estimated to have yielded around 1,700 million metric tons (Mt) of sulfides, and more than 80 VMS deposits have been recorded where individual tonnages were in excess of 1 Mt (Mining Journal, 2000b).

The mineral industry comprised a mix of state-owned, state and privately owned, and privately owned companies. Minerals belong to the state under an arrangement known as the *Regalía Principal*. The mining law of July 19, 1944, as amended, and the Hydrocarbon Law of December 26, 1950, govern the mineral industry. The Ministerio de Industria y Energía [Ministry of Industry and Energy] implements the mineral laws, regulates the private sector, and manages most of the state-owned companies through the Instituto Nacional de Industria (INI) (a state holding company). INI and Instituto Geológico y Minero are the principal Government mineral-resource agencies.

Production far exceeded domestic consumption for most nonmetallic minerals, thus leaving surpluses for export. The economic development of certain areas, such as the Asturias and the Basque regions, was based on their mineral wealth, and mining continued to be an important current and potential source of income in these and other mineral-rich areas. Trade flows were liberalized after Spain joined the EU, and the differences between Spanish tariffs and EU Common Market tariffs were significantly reduced. The mineral-related commodities in which Spain was a net exporter to other EU

countries, thereby reducing its trade deficit, were lead, mercury, nonmetallic minerals manufactured products, slate and other crude industrial minerals, and zinc.

Some of Spain's regional governments showed interest in the development of mining in their territory. The independent government of Andalucía (the *Junta de Andalucía*) completed its first mining development plan (1996-2000), which involved large shareholders in the investigation and exploitation of mineral resources, the development of mining technology, and the reform of the *Junta's* own mining administration (Mining Journal, 2000b).

Economically speaking, 2000 appeared to be a good year for Spain. The gross national product grew by 3.5%, which was only slightly lower than the 3.8% achieved in 1999. There was an upsurge in private consumption and in expenditure on construction. Recorded unemployment at the end of 1999 was equivalent to 9.8% of the working population.

Productive capacity was running at more than 80%, and the industrial production index showed an annual overall increase (table 2). The Spanish Government influenced the economy primarily through regulation rather than through direct ownership, though the Government does own all or part of a few of Spain's largest companies (table 3). Spain has moved rapidly toward privatization out of conviction and owing to the limited options available for curbing the budget deficit. Successful privatizations included Telefonica S.A., Gas Natural S.A., and the petrochemical company Repsol S.A. The remaining state shares of Iberia Airlines were to be sold by yearend (U.S. Embassy, Madrid, Spain, 2000, p. 9-10).

With a few exceptions, mine production continued at about the same level as that of 1999. Of the major metals, commodities with a significant increase in metal production were copper, lead, and zinc in ore. Production of silver decreased, and since 1999, cadmium metal production and iron ore mining ceased altogether. Total refined copper production increased marginally, and secondary lead metal output increased. Primary aluminum metal production stayed about the same. The mercury mines at Almadén continued to produce at levels in accordance with market demand.

Among industrial minerals, fluorspar and potash production decreased, and magnesite production increased. Quarried mineral products, particularly quarried stone, accounted for a significant share of the value of all mineral production in Spain. In mineral fuels and related materials, natural gas output increased, and petroleum output decreased by about 26%. Spain's production of crude oil was limited, and the country continued to be a large importer of mineral fuels.

Commodity Analysis

Spain was one of the larger coal producers in the EU, with an output of more than 23 Mt in all types of coal in 2000. Coal reserves were abundant but difficult to mine. Consequently, the

cost of production was high, which made Spanish coal less competitive than that of many other countries. The leading producer of bituminous coal was Huelleras del Norte S.A., and the leading producer of lignite was Empresa Nacional de Electricidad S.A.

Dowa Mining Co. Ltd. of Japan and Rio Tinto plc of the United Kingdom formed a joint venture to explore for metals at properties owned by Rio Tinto in the IPB. Dowa can earn a 33% interest in the properties by contributing to exploration over the next 3 years, although no details were given as to the amount to be contributed (Mining Magazine, 2000a).

Alumina and primary aluminum were produced almost entirely by Alcoa Inespal S.A. Alcoa was a holding company with three primary aluminum plants and three flat-rolled sheet and extrusions plants. Alumina Española S.A. (a subsidiary of Alcoa located near San Ciprián) was Alcoa's only producer of alumina and alumina hydrates in Europe. The company was also a producer of primary aluminum in standard sheets and special aluminum alloys.

Cambridge Mineral Resources plc of the United Kingdom entered into a conditional agreement to acquire three properties Falle de Leon, Lomero-Potayos, and Salamon, through a reverse takeover in which it acquired Recursos Metallicos SL. Located within the IPB, Lomero-Potayos is made up of two contiguous advanced gold-enriched polymetallic deposits that contain estimated indicated resources of 4.25 Mt at 5.76 grams per metric ton (g/t) gold, 116.9 g/t silver, 1.58% copper, 1.48% lead, and 5.71% zinc in massive sulfides. Salamon is an epithermal gold prospect in northern Spain estimated to contain 443,000 metric tons (t) at 7.86 g/t gold. Falle de Leon covers 2,100 square kilometers (km²) and is contiguous with Salamon (Mining Journal, 2000a).

Navan Resources (Almagrera) Ltd.'s Aguas Teñidas copper-lead-zinc mine near Huelva was operating at the full 600,000-metric-ton-per-year (t/yr) rate following the completion of the capital works improvement program. The Aguas Teñidas Mine supplies Navan's nearby Almagrera mill and concentrator (formerly owned by Almagrera S.A.). Navan also operates the Almagrera Mine. The Almagrera operation was marginal and had incurred significant losses until Navan developed the higher graded ore of the Aguas Teñidas Mine (Mining Journal, 2000c).

Final approval for the commencement of open pit mining operations at the Carles gold deposit was received by Rio Narcea. Operations began in late 2000 with an expected rate of about 600 kilograms per year. Rio Narcea estimated that Carles hosts 1.2 Mt of proven and probable reserves with an average grade of 4.26 g/t gold, of which 728,000 t averaged 3.89 g/t gold is minable by open pit methods (Mining Magazine, 2000b).

Barrick Gold Corp. and Rio Narcea Gold Mines Ltd. had signed a joint-venture agreement for Barrick's participation in some of Rio Narcea's gold projects (Mining Journal, 2000d). Barrick, which owned 60% of the joint venture to explore the Rio Narceas, the Navelgas, the Palencia-Leon, and the Venteniella gold belts in northern Spain, withdrew at yearend. The joint venture did not cover Rio Narcea's El Valles and Carlés project areas. The joint venture had completed 3,400 line kilometers of airborne geophysical surveying in the Rio Narcea and the Navelgas belts and had drilled 26 holes that totaled 10,848 meters to test individual targets (Northern Miner, 2000).

A principal producer of iron ore was Compañía Andaluza de Minas S.A., which had worked its open pit mine at Alquife (Granada). Mining was halted in October 1996, resumed briefly, then halted again. The mine remained inactive at yearend 2000 owing to market conditions. The very small amount of iron ore produced was for nonmetallic applications.

Arbed Group of Luxembourg's Spanish affiliate Aceralia S.A. was continuing negotiations with Mexico's Grupo Acerero del Norte (GAN) and creditor banks for a possible joint venture with Altos Hornos de Mexico S.A. (Ahmsa), which was a 3.7-Mt liquid-steel capacity integrated steelmaker. As Ahmsa's major shareholder, GAN would like to restructure the company's \$1.8 billion debt. Ahmsa defaulted on interest payments and won legal protection against its creditors in May 1999. The Aceralia-Ahmsa deal would include the joint operation of mills that would account for about one-half of Ahmsa's 3.7-Mt capacity along with its domestic service and distribution centers. The mills produced sheet, beams, bars, tinplate, and structural sections at Ahmsa's works in Monclova, Coahuila, Mexico (Metal Bulletin, 2000a).

Spain's production of coated steel rose by about 20% in 1999 and increased even more in 2000 as newly installed capacity ramped up to full production rates. Much of Spain's galvanized sheet production takes place at Sagunto on the country's Mediterranean coast (Metal Bulletin, 2000c).

Aceralia inaugurated the new galvanizing line at its Avilés works in northern Spain. The capacity will be 400,000 t/yr of coils 750 to 1,600 millimeters (mm) wide and 0.4 to 2 mm thick. The \$7 million investment was directed at securing Aceralia a dominant position in the supply of galvanized sheets to the Spanish automobile industry, in which it aimed to hold a 70% market share. Aceralia operated galvanizing lines at Sagunto (400,000 t/yr) and Lesaca (225,000 t/yr) and held a 25% stake in the Solmed galvanizing line (400,000 t/yr) whose majority owner was Sollac of France (Metal Bulletin, 2000b).

Boliden Apirsa S.A.'s Los Frailes Mine, which was one of the biggest open pit zinc mines in Europe, was closed in early 1998 after a large toxic spill. Mining operations started mid-1999 after the license and a permit to dump tailings in the Aznalcóllar open pit were granted. The mine has been operating at a loss since reopening. Boliden was intending to continue operations until the planned completion of pit 2 in 2001, but not to proceed with the next phase, which was a pushback for pit 3. Boliden was looking for ways to continue operations after pit 2 is mined out, including sale of the property. If this effort is not successful, then the mine will be shut down (Engineering and Mining Journal, 2000).

Spain was Europe's only celestite producer and the second largest producer in the world after Mexico and had the largest known world reserves of celestite. The celestite sector was experiencing a production boom related to a \$23 million strontium carbonate plant in Cartagena, which was inaugurated in early 2000. The plant was built by Quimica del Estroncio S.A. and had a capacity of 22,000 t/yr, about 20% of world production (Industrial Minerals, 2000a).

Caustic and sintered grades of magnesite were produced in Spain for nonrefractory and refractory markets, and crude magnesite was produced from deposits located in Navarra and Lugo that were used to make magnesia-based refractory bricks. Output from both was on an upward trend in the 1990s. The increase in crude magnesite production reflects improvements in

the steel industry, where refractory bricks are used to line furnaces. Total production was worth about \$20.5 million (Industrial Minerals, 2000b).

Magnesitas Navarras S.A. was set to be privatized completely following Magna Inversiones S.A.'s acquisition of a 51% interest in Magnesitas. The sale left the state-owned enterprise Mafinco with a 48.7% interest and the Belzance family (owners of the mining concession) with 0.3% interest. Upon fulfillment of an investment program, Magna will have the right to increase its stake in Magnesitas to more than 99%. Magnesitas has a combined capacity for dead burned and caustic magnesia of 140,000 t/yr, which it produced at its plant at Zubiri, Navarra (Industrial Minerals, 2000c).

Spain maintained its world leadership in sepiolite production and holds 70% of the world's reserves, mostly located around Madrid. The largest deposit was thought to be in excess of 15 Mt. High freight costs, however, have reduced profitability, so speciality clay producers were tending to concentrate on alternative markets, such as pet litter, foundry, and rheological additives (Industrial Minerals, 2000d).

Spain's electric utilities were likely to be at the front of cross-border moves in the rapidly consolidating industry in Europe. Spain has moved to partially liberalize its power market and brought forward the date for full competition to 2003, which is 4 years earlier than previously scheduled. A process of energy sector consolidation was sweeping Europe as companies sought economies of scale to compensate for lower electricity prices following the market's liberalization (Alexander's Gas and Oil Connections, August 18, 2000, Spain's power market to be in full competition by 2003, accessed September 7, 2000, at URL <http://www.gasandoil.com/goc/company/cne03342.htm>).

Although coal is Spain's most plentiful indigenous energy source, it is too expensive to extract to be competitive in a free energy market. All the major coal companies were state owned, and the Spanish Government subsidized coal production. The EU requires that mining subsidies be phased out; the European Commission (EC), however, can authorize payments where aid can be shown to be assisting in the restructuring of an industry that might falter without public money. The EC agreed that Spain could provide about \$1 billion in state aid to modernize and restructure its coal industry. In this case, the EC ruled that Spain's coal aid package was in conformity with the EU's plan to modernize, restructure, and reduce the activity of the EU coal industry between 1998 and 2002 (U.S. Energy Information Agency, January 2001, Spain—Coal, Country Analysis Brief, accessed July 17, 2001, at URL <http://www.eia.doe.gov/emeu/cabs/spain.html>).

Repsol S.A. won control of Argentina's largest oil group YPF S.A. with a \$15 billion takeover, which doubled Repsol's size

and turned it into one of the world's 10 largest oil firms. Repsol also merged its Argentine unit Astra S.A., which was an exploration and production company, with YPF.

The world's largest oil, electricity, and gas groups have begun moves toward integration. Crude producers were attracted toward power companies, and gas and electricity groups were in search of a steady supply of raw materials (Alexander's Gas and Oil Connections, February 2000, Repsol looking at different options for expansion, accessed February 24, 2000, at URL <http://www.gasanoil.com/goc/company/cne00685.htm>).

References Cited

- Engineering and Mining Journal, 2000, Spain: Engineering and Mining Journal, v. 201, no. 12, December, p. 30.
- Industrial Minerals, 2000a, Industrial minerals of Spain—Celestite: Industrial Minerals, no. 394, July, p. 53.
- 2000b, Industrial minerals of Spain—Magnesite: Industrial Minerals, no. 394, July, p. 63.
- 2000c, Privatization of Magna nears completion: Industrial Minerals, no. 395, August, p. 11.
- 2000d, Spain—Strong in sepiolite: Industrial Minerals, no. 395, August, p. 70.
- Metal Bulletin, 2000a, Aceralia-Ahmsa joint venture plan: Metal Bulletin, no. 8486, June 22, p. 29.
- 2000b, Aceralia's new galvanizing line comes on stream: Metal Bulletin, no. 8444, January 24, p. 18.
- 2000c, Spanish galv output soars as new lines start up: Metal Bulletin, no. 8498, August 7, p. 19.
- Mining Journal, 2000a, Cambridge to acquire Spanish ground: Mining Journal, v. 334, no. 8588, June 23, p. 485.
- 2000b, Fresh impetus for Spanish mining: Mining Journal, v. 335, no. 8595, August 11, p. 106-107.
- 2000c, Navan output rises: Mining Journal, v. 335, no. 8611, December 1, p. 435.
- 2000d, Spanish JV agreement: Mining Journal, v. 334, no. 8564, January 7, p. 6.
- Mining Magazine, 2000a, Europe—Dowa Mining Co. and Rio Tinto form a joint venture: Mining Magazine, v. 183, no. 1, July, p. 40.
- 2000b, Europe—Rio Narcea receives final approval for Carles: Mining Magazine, v. 183, no. 3, September, p. 145.
- Northern Miner, 2000, Rio Narcea keeps production steady: Northern Miner, v. 87, no. 4, p. 3.
- U.S. Embassy, Madrid, Spain, 2000, Spain—FY 2001 country commercial guide: U.S. Department of State, July, 106 p.

Major Sources of Information

Instituto Geológico y Minero
Rio Rosas, 23
28003 Madrid, Spain
Ministerio de Industria y Energía
Doctor Fleming, 7
28036 Madrid, Spain

TABLE 1
SPAIN: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

| Commodity | 1996 | 1997 | 1998 | 1999 | 2000 e/ |
|---|---------------|------------|------------|--------------|------------|
| METALS | | | | | |
| Aluminum: | | | | | |
| Alumina 3/ | 1,094,797 | 1,110,300 | 1,100,000 | 1,100,000 e/ | 1,200,000 |
| Metal: | | | | | |
| Primary | 361,829 | 359,904 | 361,900 | 363,900 | 365,700 4/ |
| Secondary | 153,837 | 153,800 | 154,000 | 224,000 | 240,500 4/ |
| Cadmium metal | 307 | 301 | 196 | -- | -- |
| Copper: | | | | | |
| Mine output, Cu content | 38,392 | 37,833 | 37,002 r/ | 1,738 r/ | 23,312 4/ |
| Metal: | | | | | |
| Blister: | | | | | |
| Primary | 248,500 | 288,900 | 304,330 | 252,000 r/ | 264,800 4/ |
| Secondary e/ | 22,400 | 23,800 | 30,000 | 53,000 r/ | 65,000 4/ |
| Total | 270,900 | 312,700 | 334,330 | 305,000 r/ | 329,800 4/ |
| Refined: | | | | | |
| Primary | 210,000 | 229,000 | 239,600 4/ | 250,756 4/ | 250,800 4/ |
| Secondary | 54,000 | 63,300 | 64,700 | 65,000 | 65,000 |
| Total | 264,000 | 292,000 | 304,330 4/ | 315,756 4/ | 315,800 4/ |
| Germanium oxide, Ge content | kilograms | 6,478 | 6,500 | 6,500 e/ | 6,000 e/ |
| Gold, mine output, Au content | do. | 2,832 | 1,824 | 3,295 | 5,018 r/ |
| Iron and steel: | | | | | |
| Iron ore and concentrates, Fe content | thousand tons | 588 | 58 | -- | -- |
| Metal: | | | | | |
| Pig iron | do. | 4,127 | 3,926 | 4,235 | 4,146 |
| Ferroalloys, electric furnace | do. | 1,392 | 1,650 | 1,781 | 1,600 e/ |
| Steel, crude | do. | 12,038 | 13,644 | 14,827 | 14,886 r/ |
| Steel, hot rolled | do. | 11,647 | 12,421 | 13,259 | 13,846 r/ |
| Lead: | | | | | |
| Mine output, Pb content | | 23,826 | 23,900 | 18,800 r/ | 15,000 r/ |
| Metal, secondary e/ | | 86,000 | 74,900 | 90,000 | 96,000 r/ |
| Mercury, metal | thousand tons | 862 | 389 | 675 | 433 |
| Silver, mine output, Ag content | kilograms | 108,901 | 66,000 | 47,000 | 96,000 |
| Tin, mine output, Sn content e/ | | 1,917 4/ | 2,000 | 2,000 | 2,000 |
| Titanium dioxide e/ | | 18,000 | 18,000 | 16,000 | 16,000 |
| Uranium, mine output, U ₃ O ₈ content | thousand tons | 424 | 425 | 335 | 362 r/ |
| Zinc: | | | | | |
| Mine output, Zn content | | 139,589 | 171,800 | 128,100 | 109,400 |
| Metal, primary and secondary | | 360,800 | 364,200 | 358,300 | 393,000 r/ |
| INDUSTRIAL MINERALS | | | | | |
| Barite, BaSO ₄ | | 28,000 | 90,000 | 70,000 | 62,000 |
| Bromine e/ | | 100 | 100 | 100 | 100 |
| Calcium carbonate e/ | | 1,650 | 1,750 | 1,880 | 1,950 r/ |
| Cement, hydraulic, other than natural | thousand tons | 25,157 | 27,632 | 27,943 r/ | 30,800 r/ |
| Clays: | | | | | |
| Attapulgit e/ | | 130,140 4/ | 125,000 | 130,000 | 130,000 |
| Bentonite | | 151,155 | 170,000 e/ | 193,000 | 190,000 e/ |
| Kaolin, washed | | 317,918 | 296,000 | 310,000 | 320,000 r/ |
| Other e/ | thousand tons | 15,000 | 20,000 | 20,000 | 15,000 |
| Diatomite and tripoli e/ | | 34,492 4/ | 36,000 | 56,000 | 60,000 |
| Feldspar | | 415,189 | 398,000 | 430,000 | 450,000 r/ |
| Fluorspar, CaF ₂ content | | | | | |
| Acid-grade | | 109,085 | 110,000 e/ | 110,000 e/ | 133,000 r/ |
| Metallurgical-grade | | 7,441 | 10,000 e/ | 14,000 e/ | 9,000 r/ |
| Total | | 116,526 | 120,000 e/ | 124,000 e/ | 142,000 r/ |
| Gypsum and anhydrite, crude | thousand tons | 8,191 | 8,300 | 7,500 | 9,450 r/ |
| Kyanite, andalusite, related materials e/ | | 2,000 | 2,500 | 2,500 | 2,500 |
| Lime, hydrated and quicklime e/ | thousand tons | 1,500 | 1,500 | 1,500 | 1,500 |
| Magnesite, calcined | | 150,000 e/ | 171,000 | 201,000 | 211,000 r/ |
| Mica | | 2,507 | 2,500 | 2,500 e/ | 2,500 e/ |
| Nitrogen, N content of ammonia | thousand tons | 466 | 497 | 460 e/ | 437 |
| Pigments, mineral: e/ | | | | | |
| Ocher | | 8,000 | 8,000 | 7,000 | 7,000 |
| Red iron oxide | | 15,000 | 15,000 | 15,000 | 15,000 |

See footnotes at end of table.

TABLE 1--Continued
SPAIN: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

| Commodity | 1996 | 1997 | 1998 | 1999 | 2000 e/ |
|--|----------|------------|------------|------------|------------|
| INDUSTRIAL MINERALS--Continued | | | | | |
| Potash, K ₂ O equivalent | 717,064 | 639,000 | 597,000 | 656,000 | 653,000 4/ |
| Pumice e/ | 700,000 | 600,000 | 600,000 | 600,000 | 600,000 |
| Pyrite, including cuprous, gross weight | 1,042 | 993 | 868 | 733 | 750 |
| Salt: | | | | | |
| Rock, including byproduct from potash works | 2,216 | 2,200 e/ | 2,200 | 2,200 | 2,300 |
| Marine and other | 1,220 | 1,400 e/ | 1,200 | 1,400 | 1,500 |
| Sand and gravel, silica sand e/ 5/ | 5,300 | 5,800 | 6,200 | 6,550 r/ | 6,600 |
| Sepiolite, meerschaum | 761,596 | 695,000 | 750,000 | 800,000 | 750,000 |
| Sodium compounds, n.e.s.: | | | | | |
| Soda ash, manufactured e/ | 500 | 500 | 500 | 500 | 500 |
| Sulfate, natural: | | | | | |
| Glauberite, Na ₂ SO ₄ content | 667,177 | 650,000 | 650,000 | 675,000 | 660,000 |
| Thenardite, Na ₂ SO ₄ content | 187,746 | 180,000 e/ | 180,000 e/ | 200,000 | 200,000 |
| Manufactured e/ | 100,000 | 125,000 | 125,000 | 125,000 | 125,000 |
| Stone: e/ | | | | | |
| Chalk | 140 | 140 | 136 r/ | 136 r/ | 140 |
| Dolomite | 5,100 | 5,400 | 5,000 | 9,080 r/ | 8,700 4/ |
| Limestone | 2,400 | 2,500 | 2,200 | 2,200 | 2,500 |
| Marble, ornamental | 2,347 4/ | 2,400 | 2,400 | 3,850 r/ | 3,687 4/ |
| Marl | 8,500 | 8,950 | 9,845 4/ | 10,030 r/ | 9,966 4/ |
| Basalt | 1,200 | 1,400 | 1,000 | 1,000 | 1,000 |
| Granite, ornamental | 1,295 4/ | 1,400 | 1,400 | 1,750 r/ | 1,188 4/ |
| Ophite | 2,200 | 2,200 | 2,000 | 2,000 | 2,000 |
| Phonolite | 650 | 650 | 650 | 650 | 600 |
| Porphyry | 800 | 800 | 1,000 | 1,000 | 1,000 |
| Quartz | 1,438 4/ | 1,520 | 1,500 | 1,720 r/ | 1,700 |
| Quartzite | 2,200 | 2,400 | 2,000 | 2,200 | 200 |
| Sandstone | 2,600 | 2,500 | 2,500 | 2,500 | 2,500 |
| Serpentine | 900 | 900 | 1,000 | 1,000 | 1,500 |
| Slate | 705 | 555 | 615 4/ | 600 | 600 |
| Other | 1,134 4/ | 1,000 | 1,000 | 1,000 | 1,000 |
| Strontium minerals, Sr ₂ O ₄ content | 114,829 | 92,000 e/ | 111,000 | 110,000 r/ | 112,000 |
| Sulfur: | | | | | |
| S content of pyrites | 439 | 480 | 430 | 388 | 400 |
| Byproduct: e/ | | | | | |
| Of metallurgy | 420 | 250 | 461 | 455 | 460 |
| Of petroleum | 250 | 150 | 100 | 110 | 100 |
| Of coal (lignite) gasification | 1 | 2 | 1 | 1 r/ | 1 |
| Total sulfur | 1,110 | 882 | 992 | 954 r/ | 961 |
| Talc and steatite | 109,756 | 110,000 e/ | 110,000 e/ | 111,000 | 110,000 |
| MINERAL FUELS AND RELATED MATERIALS | | | | | |
| Coal (marketable): | | | | | |
| Anthracite | 6,487 | 6,678 | 6,393 | 4,890 r/ | 4,651 4/ |
| Bituminous | 7,195 | 7,200 e/ | 6,004 | 6,828 r/ | 6,681 4/ |
| Lignite (black and brown) | 9,604 | 12,577 | 13,675 | 12,535 | 12,153 4/ |
| Total | 23,286 | 26,455 | 26,072 | 24,253 r/ | 23,485 4/ |
| Coke, metallurgical | 2,403 | 2,622 | 2,649 | 2,332 r/ | 2,470 4/ |
| Gas, natural (marketed) | 466 | 178 | 114 | 143 r/ | 179 4/ |
| Peat e/ | 50,000 | 60,000 | 50,000 | 50,000 | 50,000 |
| Petroleum: | | | | | |
| Crude | 3,846 | 2,850 | 4,013 | 2,295 | 1,700 |
| Refinery products: | | | | | |
| Liquefied petroleum gas | 17,655 | 18,954 | 18,096 | 18,000 | 18,000 |
| Naphtha | 19,797 | 22,899 | 24,990 | 25,000 | 25,000 |
| Gasoline, motor | 83,113 | 78,497 | 84,405 | 85,000 | 85,000 |
| Jet fuel | 33,504 | 33,000 | 36,000 | 36,000 | 36,000 |
| Kerosene | 15,000 | 20,000 | 30,000 | 30,000 | 30,000 |
| Distillate fuel oil | 129,080 | 138,249 | 148,969 | 150,000 | 150,000 |
| Residual fuel oil | 73,213 | 77,276 | 86,407 | 85,000 | 85,000 |
| Other e/ | 50,500 | 35,500 | 37,400 | 38,000 | 38,000 |
| Refinery fuel and losses e/ | 12,000 | 12,000 | 10,000 | 10,000 | 10,000 |
| Total e/ | 434,000 | 436,000 | 476,000 | 477,000 | 477,000 |

See footnotes at end of table.

TABLE 1--Continued
SPAIN: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

e/ Estimated. r/ Revised. -- Zero.

1/ Table includes data available through June 2001.

2/ Estimated data are rounded to no more than three significant digits; may not add to totals shown.

3/ Reflects aluminum hydrate.

4/ Reported figure.

5/ Includes sand obtained as a byproduct of feldspar and kaolin production.

TABLE 2
SPAIN: SELECTED INDICES OF PRODUCTION

(1990 = 100)

| Sector | 1997 | 1998 | 1999 | 2000 e/ |
|---------------------|------|------|------|---------|
| General | 109 | 115 | 118 | 122 |
| Mining | 90 | 90 | 88 | 91 |
| Manufacturing | 110 | 116 | 120 | 124 |
| Electricity and gas | 109 | 110 | 117 | 127 |

e/ Estimated.

Source: United Nations, 2000, Monthly Bulletin of Statistics, v. LIV, no. 12, December, p. 32.

TABLE 3
SPAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2000

(Thousand metric tons unless otherwise specified)

| Commodity | Major operating companies and major equity owners | Location of main facilities | Annual capacity |
|--------------------|--|--|-------------------------------------|
| Alumina | Alumina Española S.A. (Alcoa Inespal) | Alumina plant at San Ciprián, Lugo | 1,000 |
| Aluminum | Aluminio Español S.A. (Alcoa Inespal) | Electrolytic plant at San Ciprián, Lugo | 180 |
| Do. | Industria Española del Aluminio, S.A. (Alcoa Inespal) | Electrolytic plant at Avilés | 100 |
| Do. | do. | Electrolytic plant at La Coruña | 25 |
| Coal: | | | |
| Anthracite | Antracitas Gaiztarro S.A. | Mines at María and Paulina | 2,000 |
| Do. | Antracitas de Gillón S.A. | Mines near Oviedo | 2,000 |
| Do. | Antracitas del Bierzo S.A. | Mines near León | 1,000 |
| Bituminous | Hulleras del Norte S.A. (Hunosa) | Various mines and plant | 3,300 |
| Do. | Hulleras Vasco Leonesa S.A. | Santa Lucia Mine, Leon | 2,000 |
| Do. | Minas de Figaredo S.A. | Mines near Oviedo | 1,000 |
| Do. | Nacional de Carbon del Sur (Encasur) | Rampa 3 and San Jose Mines, Cordoba | 200 |
| Lignite | Empresa Nacional de Electricidad S.A. (Endesa) | As Pontes Mine, and Andorra Mine, La Coruña | 15,000 |
| Barite | Minas de Baritina S.A. (Kali-Chemie of Germany, 100%) | Mine and plant in Espiel area, Córdoba | 50 |
| Cement | Approximately 36 cement companies, of which the largest is: Asland S.A. | 54 plants, including: 5 (Asland) plants, of which the largest ones are plants at Puerto de Sagunto, Valencia, and at Villaluenga de la Sagra, Toledo | 44,000 (6,000) 2,000 2,000 |
| Copper: | | | |
| Metal | Atlantic Copper Holding S.A. (Freeport MacMoRan Inc., 65%, Ercros Group, 35%) | Refinery at Huelva | 270 |
| Do. | do. | Electrolytic refinery at Huelva | 105 |
| Do. | Industrias Reunidas de Cobre | Smelter at Asua-Bilbao | 30 |
| Do. | Electrolítico y Metales S.A. | Fire and electrolytic refinery at Asua-Bilboa | 36 |
| Ore, metal content | Atlantic Copper Holding, S.A. (Freeport MacMoRan Inc., 65%, Ercros Group, 35%) | Mines and plant at Arientero, near Santiago de Compostela, Corta Atalay open pit mine, Cerro Colorado open pit mine, and Alfredo underground mine, in Rio Tinto area | 12 30 |
| Do. | Navan Resources Ltd. | Migolas and Sotiel areas | 6 |
| Dunite | Pasek España S.A. | Mines and plant at Landoy, Ortigueira | 1,500 |
| Fluorspar, ore | Fluoruros S.A. (Bethlehem Steel Corp., 49%) | Plant at Caravia, near Colunga | 400 |

TABLE 3--Continued
SPAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2000

(Thousand metric tons unless otherwise specified)

| Commodity | | Major operating companies and major equity owners | Location of main facilities | Annual capacity |
|--|-----------------|--|---|-----------------|
| Fluorspar, ore--Continued: | | Fluoruros S.A. (Bethelhem Steel Corp., 49%) | Opencast mines at San Lino and Val Negro and underground mine at Eduardo, near Carav, all in Asturias | 350 |
| Do. | | do. | Plant at Collada, mines at Venros Sur and Corona | 200 |
| Gold | kilograms | Rio Narcea Gold Mines, Ltd. | Belmonte de Miranda, Asturias | 3,750 |
| Iron ore | | Compañía Andaluza de Minas S.A. (Mokta, 62%) | Mine at Alquife, Granada (closed for maintenance) | 4,000 |
| Lead: | | | | |
| Metal | | Sociedad Minera y Metalúrgica de Peñarroya de España S.A. (Peñarroya, France, 98%) | Smelter at Cartagena, Murcia | 60 |
| | | | Refinery at Cartagena, Murcia | 60 |
| Do. | | Compañía La Cruz, Minas y Fundaciones de Plomo S.A. | Smelter at Lineares, Jaén | 40 |
| | | | Refinery at Lineares, Jaén | 40 |
| Do. | | Tudor S.A. | Secondary smelter at Saragoza | 16 |
| Do. | | Ferroaleaciones Españolas, S.A. | Secondary smelter at Medina del Campo | 12 |
| Do. | | Derivados de Minerales y Metales | Secondary smelter at Barcelona | 5 |
| Ore | | Sociedad Minera y Metalúrgica de Peñarroya de España S.A. (Peñarroya, France 90%) | Opencast mine at Montos de Los Azules | 25 |
| Do. | | Andaluza de Piritas S.A. (APIRSA) | Opencast mine at Aznalcóllar, Sevilla | 21 |
| Do. | | Exploración Minera Internacional España S.A. (EXMINESA) | Underground mine at Rubiales, Lugo | 16 |
| Magnesite | | Magnesitas de Rubián S.A. | Plants at Zubiri | 100 |
| Do. | | do. | Mines and plant near Sarria, south of Lugo | 220 |
| Mercury | flasks | Minas de Almadén y Arrayanes S.A. (Government, 100%) | Mines and smelter at Almadén | 70,000 |
| Petroleum: | | | | |
| Crude | barrels per day | Chevron S.A. | Oilfield at Casablanca | 300 |
| Refined | do. | Repsol Petróleo S.A. | Refineries at Escombreras | 200,000 |
| Do. | do. | do. | Puertollano | 14,000 |
| Do. | do. | do. | Tarragona | 260,000 |
| Do. | do. | Refinería de Petróleos del Norte S.A. (Petronor) | Refinery at Somorrostro | 240,000 |
| Do. | do. | Compañía Española de Petróleos S.A. (Cepsa) | Refinery at Santa Cruz de Tenerife | 160,000 |
| Do. | do. | Petroleos del Mediterraneo S.A. (Petromed) | Refinery at Castellón de la Plana | 120,000 |
| Do. | do. | Compañía Iberica Refinadora de Petróleos S.A. (Petroliber) | Refinery at La Coruña | 140,000 |
| Potash, ore | | Iberpotash S.A. (Dead Sea Works Ltd., 60%; La Seda S.A., 20%; Tolsa S.A., 20%) | Mines and plants at Suria, near Barcelona | 850 |
| Pyrite | | Compañía Española de Mines de Tharsis | Mines and plants at Tharsis and Zarza, near Seville | 1,300 |
| Do. | | do. | Plant at Huelva | 600 |
| Do. | | Rio Tinto Minera S.A. (Rio Tinto plc, 75%; Rio Tinto Zinc, 25%) | Mines and plant at Rio Tinto, near Seville | 900 |
| Sepiolite | | Tolsa S.A. | Mine and plant at Vicalvaro, near Madrid | 100 |
| Do. | | Silicatos-Anglo-Ingleses S.A. | Mine and plant at Villegas near Madrid | 200 |
| Sodium sulfáte | | Crimidesa S.A. | Mine and plant at Cerezo de Rio, Burgos | 600 |
| Steel | | Aceralia Corporación Siderúrgica (Arbed S.A., 35%) | Plants at Avilés, Gijon, Sagunto, and Sestao, | 8,000 |
| Strontium | | Solvay Minerales S.A. | Mines and plant at Escuzar, Granada | 85 |
| Do. | | Canteras Industriales S.A. | Mine and plant at Montevides, Granada | 50 |
| Uranium, U ₃ O ₈ | metric tons | Empresa Nacional del Uranio (Government, 100%) | Mines and plant near Ciudad Real | 500 |
| Zinc: | | | | |
| Metal | | Asturiana de Zinc S.A. (Glencore International AG, 44%) | Electrolytic zinc plant at San Juan de Nieva | 320 |
| Ore | | do. | Reocin mines and plants near Torrelavega, Santander | 500 |
| Do. | | Boliden Apirsa S.A. (Boliden Ltd., 100%) | Los Frailes Mine at Aznalcóllar | 3,500 |
| Do. | | Exploración Minera Internacional España S.A. (EXMINE S.A.) | Underground mine at Rubiales, Lugo | 500 |
| Do. | | Sociedad Minera y Metalúrgica de Penarroya-Espana S.A. | Mines and plants at Montos de los Azules y Sierra de Lujar, San Agustin | 200 |